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# INSURANCE FRAUD CHALLENGES IN SAUDI ARABIA: EVIDENCE FROM MARKET REPORTS AND CLAIMS DATA

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## ABSTRACT

The study examines insurance fraud challenges in Saudi Arabia's motor insurance sector using secondary quantitative data drawn from official market and transport statistics. Motor insurance market indicators, particularly net claims incurred, are obtained from reports published by the Saudi Central Bank (SAMA). These insurance indicators are compared with publicly available road and transport statistics, including traffic injuries and fatalities, sourced from the General Authority for Statistics (GASTAT). The study adopts a descriptive analytical approach, employing trend analysis, year-on-year percentage changes, and ratio-based measures to assess whether growth in motor insurance claims aligns with underlying road accident exposure. Ratios such as claims per traffic injury and claims per traffic fatality are used to normalize claims outcomes relative to accident indicators. The results reveal notable volatility in motor insurance claims and identify periods where claims levels appear elevated relative to stable or declining accident trends. While the analysis does not provide direct evidence of fraudulent claims, the observed divergence highlights structural conditions associated with claims leakage, cost inflation, and increased fraud-related pressure. The study concludes by emphasizing the importance of improved data integration, enhanced claims monitoring, and coordinated anti-fraud efforts among insurers and regulators to strengthen the transparency and sustainability of the motor insurance market in Saudi Arabia.

**KEYWORDS:** Motor Insurance, Fraud Detection, Claims Management, Traffic Accidents.

## 1. INTRODUCTION

Insurance fraud has become an ongoing problem to insurance markets across the globe, as it has deteriorated financial stability, distorted pricing mechanisms and diminished the confidence of the population. In Saudi Arabia, the value of combating insurance fraud has grown in line with the fast growth of the insurance market as part of the Vision 2030 reforms and the increased compulsory insurance penetration of motor insurance. In the Saudi insurance market, the legal, regulatory, and socio-economic environment is unique, and the prevention of fraud should not only correspond to the global good practices but also be consistent with the Islamic Shariah provisions and the domestic expectations of regulators (Ahmed, 2021). Since motor insurance takes up a large portion of the total premiums and claims, inefficiencies in this area, which are related to fraud, represent a systemic risk to both regulators and insurers. Law and institution-wise, insurance fraud in Saudi Arabia is influenced by the changing regulatory frameworks and enforcement systems. The comparative legal analyses suggest that there are gaps between the Saudi insurance legislation and the developed international frameworks, particularly on such points concerning the definition of fraud, evidence standards, and preventive approaches (Albalawi, 2021). This could result in the hardship of detecting and prosecuting fraudulent claims at a similar degree especially in motor insurance where claims are numerous and the cost of verification is also high. Simultaneously, as the area of financial-sector regulation expands, the pressure on supervisory authorities to enhance control intensifies, so fraud control can become an essential part of market discipline and solvency protection (Orlando and Bace, 2021). Empirical studies indicate that successful fraud detection requires both regulation and organizational practice and professional judgment. Research on the perception of fraud related to accountants and auditors in Saudi Arabia indicates that the level of awareness of fraud risk is not bad, but its detection is hampered by the inadequate data integration, inconsistency of reporting standards, and the use of manual controls (Alfordy, 2022). They are especially applicable to motor insurance, in which the claims can usually have several parties involved, such as drivers, workshop, assessors, and brokers, which create chances to exaggerate, collude, and fake the accidents.

In addition to the Saudi setting, there is a generalized research of international literature on the topic of analytical and data-driven fraud detection in motor insurance. Initial comparative analysis has shown that superior classification methods are superior to conventional rule-based systems in detecting suspicious automobile claims (Viaene et al., 2002). Following this, recent studies have then utilized data mining and supervised learning algorithms to auto insurance data, indicating better detection rates using decision trees, support vector machines, and ensemble models (Na Bangchang et al., 2023). These strategies emphasize the importance of structured claims information in unravelling concealed patterns in fraud. The development of artificial intelligence and machine learning has also changed fraud detection abilities. According to the evidence presented in cross-country insurance datasets, the use of machine learning models can substantially improve the fraud detection in comparison to traditional statistical approaches, especially in large-scale claims settings (Aslam et al., 2022). New designs (like multimodal and network-based models) in the motor insurance sector combine textual, numerical, and relational data to identify complex fraud behaviour which single-source models might be unable to detect (Asgarian et al., 2023). Even more recently, generative and hybrid methods, such as variational autoencoders and diffusion models, have been suggested to solve data imbalance and changing tactics of fraud in auto insurance claims (Bekkaye et al., 2025).

Although these methodological advances have been made, there is still an unequal use of advanced models in markets. Studies that concentrate on motor insurance fraud emphasize that the availability, quality, and interpretability of much of the data will frequently restrict its practical implementation, especially in newly established regulated markets (Schalck, 2025). To address these limitations, feature selection and cost-sensitive learning algorithms have been introduced to compromise between the ability to detect and the feasibility of working (Ozaltin and Erdemir, 2025). Nevertheless, the majority of this evidence has been obtained in non-Saudi settings and therefore, there are questions on external validity with references to Saudi Arabia regulatory and market structure. In Saudi Arabia, the academic literature has been dominated by scholars focusing on legal examination, administration and fraudulent issues affect the sector as opposed to empirical evidence in the field of motor insurance. The literature covering the insurance company fraud issue is frequently conceptual or policy-oriented and tends to concentrate on the issues of governance, ethical risks, and organizational controls, but not to analyze the claims data itself (Alhunieti and Al-Khasawneh, 2025). This loophole is especially

significant due to the accessibility of formal market and transportation data. The current literature on fraud detection in insurance also prefers to concentrate on healthcare or cross-sectoral applications, and they might not be the most appropriate to understand the dynamics of motor insurance fraud (Nabrawi and Alanazi, 2023). Despite the importance of motor insurance in Saudi Arabia, limited empirical evidence links aggregate insurance claims behaviour with underlying road accident indicators. This gap makes it difficult to distinguish legitimate claims growth from claims leakage or fraud-related pressures, constraining effective regulatory oversight and data-driven fraud risk management.

### *1.1. Research Objectives*

1. To examine trends and volatility in motor insurance claims in Saudi Arabia using market-level data from Saudi Central Bank (SAMA) reports
2. To analyze road accident exposure indicators, including traffic injuries and fatalities, using official statistics published by GASTAT
3. To assess the alignment between motor insurance claims behavior and road accident indicators to identify periods of elevated claims pressure that may signal fraud-related challenges or claims inefficiencies

## 2. METHODOLOGY

### *2.1. Study Design and Analytical Approach*

The research design used in this study is a quantitative and descriptive study to investigate the issue of insurance fraud in the Saudi Arabian motor insurance industry. In the absence of publicly available claim-level data on confirmed fraud cases, the analysis focuses on market-level indicators that reflect claims pressure and broader challenges commonly associated with insurance fraud. The methodological choice is more of trend analysis and calculations of percentage changes and ratio-based comparisons instead of causal and predictive modelling. The design is suitable in exploratory research of fraud using secondary data, as well as it enables identification of structural discrepancies between insurance claims and accident exposures.

### *2.2. Data Sources and Data Coverage*

The study makes use of secondary quantitative data. The Saudi central bank insurance statistical reports provide information regarding motor insurance markets such as net claims made and annual growth rates. Traffic injuries and fatalities are the road traffic accidents indicators, which are provided by the General Authority of statistics (GASTAT) Road Transport Statistics. They are publicly available datasets that are utilized in policy relavant and academic studies. The variation in time coverage of data sources tells about the constraints of data availability and is managed by the analytical design of the study.

### *2.3. Data Preparation and Variable Construction*

All data were summed on an annual basis to make sure that there is consistency across sources. Cleaning and merging of insurance and traffic datasets were done using the calendar year as the integrating factor. Analytical variables were constructed in terms of total motor insurance net claims incurred, percentage change of claims per year, total traffic injuries, and total ranged fatality. In order to standardize the insurance claims in comparison to the exposure to accidents, two ratio indicators, viz., claims per traffic injury and claims per traffic fatality, were calculated. Only in the years where the data on insurance and traffic was both available, ratios were calculated. There was no interpolation or estimation on missing data to maintain the integrity of data.

### *2.4. Descriptive and Trend Analysis Methods*

The analysis uses descriptive statistical methods in investigating the trends of insurance claims and road accident indicators over time. The trend analysis will be performed with the help of line plots that will help to visualize the changes in the motor insurance claims, traffic injuries, and traffic fatalities throughout the time. The volatility of claims growth is evaluated by the percentage changes on a year-on-year basis and reveals when the claim growth was unusually fast or slow. Such approaches allow drawing a clear line between the outcome of financial claims and exposure to physical accidents without restrictive statistical assumptions.

### *2.5. Ethical Considerations*

The secondry data used in this study is retrieved through publicly available and official sources, such as publications by the Saudi Central Bank (SAMA) and the General Authority of Statistics (GASTAT). None of the individual-level, confidential, or personally identifiable information is applicable at any point of the analysis. Consequently, the study does not deal with human subjects and no ethical approval or informed consent is needed. All data are also analysed and reported in aggregate data to ascertain neutrality and prevent misrepresentation of individual institutions, firms, or people. In keeping with ethical standards, the study takes a prudent approach of interpretation by placing increased focus on claims pressure and structural market issues, as opposed to making assertions of established fraudulent behavior.

## 3. RESULTS

### 3.1. Evolution of Motor Insurance Claims and Claims Pressure

The net claims incurred by the motor insurance market at the Saudi central bank (SAMA) depict sharp variations in the market level data between the year 2009 and 2022. The number of claims grew slowly in the early years, and there was a high growth rate between 2013 and 2016 when the total claims were at their history peak. This stage is an indication of increased pressure of claims in a season of high market growth. Since 2017, the number of claims reduced steadily until 2020 and maybe indicates a time of market correction that may have been related to tightening underwriting, regulatory measures, or driving habits. But in the year 2021 and 2022, there was a sharp backlash on the claims, with the growth surpassing 25 percent in the last year. The recurring cycle in the growth and contraction in the claims indicates structural problems of the control of motor insurance claims as time goes by. This volatility may make it more complicated to track the abnormal behavior of claims by insurers and exposes them to more operational inefficiencies that are well known as circumstances in which the risk of fraud can accelerate. Table 1 shows the dynamics of the net motor insurance claims incurred in Saudi Arabia during 2009 to 2022, as well as the growth rates on a year-on-year basis. The table illustrates the specific stages of the claims behavior such as the moderate growth stage, a period of rapid expansion when growth rates were incredibly high, a decline, and robust recovery in the last few years.

*Table 1: Net Motor Insurance Claims and Year-on-Year Growth (2009-2022)*

| Year | Net Motor Insurance Claims Incurred (SAR) | Year-on-Year Growth (%) |
|---|---|---|
| 2009 | 1,850,174 | – |
| 2010 | 1,892,392 | 2.28 |
| 2011 | 2,459,178 | 29.95 |
| 2012 | 3,218,284 | 30.87 |
| 2013 | 5,286,860 | 64.28 |
| 2014 | 6,276,733 | 18.72 |
| 2015 | 7,993,657 | 27.35 |
| 2016 | 8,805,727 | 10.16 |
| 2017 | 7,718,856 | −12.34 |
| 2018 | 6,556,957 | −15.05 |
| 2019 | 5,999,790 | −8.50 |
| 2020 | 5,171,502 | −13.81 |
| 2021 | 6,199,615 | 19.88 |
| 2022 | 7,782,531 | 25.53 |

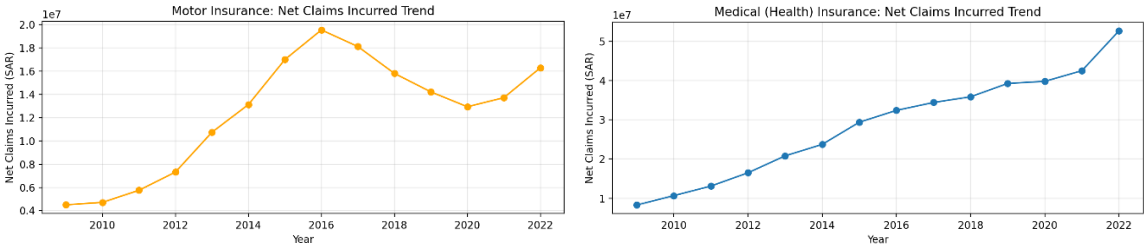


*Figure 1: Trend of Net Claims Incurred for Health (Medical) Insurance in Saudi Arabia (2009-2022).*

*Figure 1 presents the trends of net claims incurred for Health (Medical) and Motor insurance over time and are included solely for comparison purposes. They provide a visual contrast of claim patterns across the two insurance lines and are not intended for causal analysis or independent interpretation.*

### 3.2. Volatility in Year-on-Year Claims Growth

The motor insurance claims changes between years also demonstrate the volatility of claims experience in the Saudi motor insurance market. There are several years in which the growth has been very high especially in the years 2011 to 2016 where the increase has been more than 25 percent per year in some cases. On the other hand, the 2017-2020 period is associated with a negative growth that has been negative, which implies that the results of claims have changed sharply. The situation highlights the sensitivity of claims to market and operational factors as the strong growth has gone back in 2021 and 2022. The volatility of claims increase is also an important challenge faced by the insurers because the quick growth and decline may overload claims management systems and diminish the efficiency of traditional monitoring tools. In terms of a fraud-risk the such instability can lower baseline expectations in comparison to which red flags are raised thus making it more difficult to distinguish

between normal claim expansion and abnormal or opportunistic claiming behavior.

### *3.3. Trends in Road Traffic Injuries*

The GASTAT data point on road traffic injuries during the period under analysis offers a significant reference point to evaluate exposure to road accidents (Table 2, Figure 2). The levels of reported traffic injury are constant throughout the period, and there is only year-to-year fluctuation, but is not increasing steadily. This constancy indicates that there was no material increase in exposure to non-fatal road accidents in the period of the available traffic data. Taken together with an increase in motor insurance claims, there is no equivalent rise in injury trends, suggesting that claims pressure cannot be entirely attributed to the sole effect of accident frequency. Table 2 provides a summary of the official road traffic accident indicators in Saudi Arabia in 2022-2024 of which it reports national totals of traffic injuries and traffic fatalities annually. These metrics are used as exposure and severity indicators of the research, which allow comparing the result of motor insurance claims and the actual state of the road safety. The table indicates that the number of injuries is generally the same throughout the time, whereas the number of deaths is gradually decreasing, which says something about the reduction in the severity of accidents. In general, Table 2 gives transport-risk background against which such claims pressure in motor insurance market are interpreted, and also to comment on the challenges of frauds without using data on claims fraud cases on a case-by-case basis.

***Table 2: Road Traffic Injuries and Fatalities (Observed Period)***

| Year | Traffic Injuries | Traffic Fatalities |
|---|---|---|
| 2022 | 24,446 | 4,555 |
| 2023 | 24,002 | 4,423 |
| 2024 | 24,077 | 4,282 |

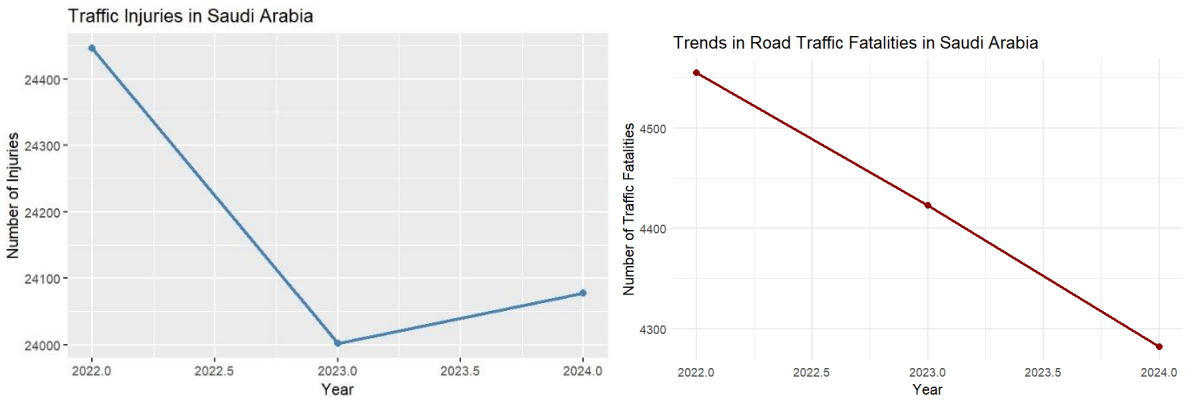


***Figure 2 (a): Trends in Road Traffic Injuries in Saudi Arabia, Figure 3 (b): Trends in Road Traffic Fatalities in Saudi Arabia.***

***Note:*** *The figure is based on data covering three consecutive years and is intended to illustrate short-term trends in road traffic fatalities rather than long-term dynamics.*

*Figure 2(a) shows the trend of the reported road traffic injuries during the period under analysis. The number shows that the level of injuries is comparatively consistent with insignificant annual change and no general upward tendencies. This trend indicates that non-fatal road accident exposure was quite generally constant over the period studied.*

*Figure 3 (b) shows the tendency of road traffic fatalities in Saudi Arabia during the period under study. The graph demonstrates the steady decline of the upward tendency, which proves the decrease in the severity of accidents and the general increase in road safety. Traffic killings are a broadly employed proxy of accident severity and their decrease indicates that the severe road accidents became less common in the period of analysis.*

### *3.4. Trends in Road Traffic Fatalities and Accident Severity*

The statistics of Road traffic fatalities show a steady decreasing trend of the years under observation (Table 2, Figure 3). Traffic fatalities are a widely used measure of the severity of accidents and the fact that they have decreased steadily is an indication that the road safety condition has been improved. This trend denotes that the intensity of road accidents was reduced as opposed to becoming worse during the period of analysis. To the contrary, the motor insurance claims were also high within one period of the same time interval. The misalignment between the enhancement of the indicators of accident severity and the increase in the rate of claims

points out to a structural problem of insurers because the results of claims seem to have less and less connection to the indicators of severe accidents. This misalignment is often talked about in the literature as a possible sign of inefficiencies in operations, inflation of costs, or increased exposure to the effects of fraud.

### *3.5. Claims-to-Accident Ratios and Indicators of Fraud-Related Challenges*

Claims-to-accident ratios were calculated to assess the relationship between insurance claims and accident exposure for periods in which both insurance and road accident data were available. These normalized indicators give information about claims intensity compared to known accident outcomes. Taken together with stable levels of injuries, as well as reducing fatality rates, the findings indicate that the level of claims pressure during the mixing period was quite high compared with the indicators of the period accidents. Although the ratio analysis is constrained by the data availability, the results provide an opportunity to single out the structural preconditions within which the risks of fraudulent problems may occur, including leakage of claims, cost inflation, or the inability to control fraudulent claims. Though the analysis is not a direct evidence of fraudulent performance, it emphasizes the need to monitor the data better, integrate it and conduct a systematic comparison of the insurances and transport data to pursue the right approach to the creation of fraud risks.

## 4. DISCUSSION

These findings reveal a structural difference between the Saudi Arabia motor insurance claims and road accidents indicators. Even though the motor insurance claims were highly volatile and reached its maximum point in 2022, the traffic injuries remained rather stable, and traffic deaths decreased in the same year. This mismatch suggests that the variations in the outcomes of claims cannot be traced down to the frequency and severity of accidents only. Instead, it has been shown to raise the pressure on claims in the motor insurance market particularly when the claims are growing high. As has been mentioned in previous literature on insurance frauds, this deviation may be linked with the existence of operational inefficiencies, cost inflation, or it may be due to exposure to opportunistic or fraudulent claiming. It is important to note that the results are not part of the definite, but rather suggestive evidence of a problem related with fraud, which is indicative of the structural context that is likely to enhance the risk of committing a fraud, but does not illustrate that there is a fraudulent activity.

The findings have significant implications on Saudi-based insurers and regulators. High rates of claims as compared to decreasing or stabilizing accident rates indicate that more effective claims control and fraud risk control are required. When dealing with a rapidly growing insurance company, the insurers can enjoy better data integration, better claims analytics, and direct observation of the abnormal patterns of claims. The findings highlight to the policymakers and regulators the importance of integrated reporting systems which will connect data on insurance claims with transport and safety statistics. Better data sharing and standardization would enhance the early-warning of the risk of fraud. On a larger scale, the mitigation of claims leakage and inefficiencies should assist in making the market sustainable, accurate in pricing, and trustworthy to consumers in the motor insurance market.

The results of this study are in line with previous insurance fraud literature which focuses on using indirect indicators in cases where claim-level data on fraud is not available. The current analysis is also based on market-level claims behavior and abnormal claims pressure just like Dionne et al. (2009) and Derrig (2002), but as with the latter, fraud is a latent and hard-to-detect phenomenon. Although more complex methods like machine learning and network-based analysis in Granular claims data are used in advanced research, like those by Vorobyev (2024) and Viaene et al. (2007), the present study uses a descriptive, macro-level methodology because of the inherent limitations of the available data, and this situation continues to be the norm in policy-driven research concerning fraud. The identified disconnection between claims growth and accident indicators is consistent with elements of OECD frameworks that point out claim leakage and institutional inefficiencies as warning indicators (Brezzi et al., 2021). Practical fraud detection can be based on governance frameworks, data ecosystems, and quality reporting mechanisms to enable the prompt detection and resolution of fraud elements affecting insurance practices (Abdallah et al., 2016). Moreover, previous experience of insurance programs regulation shows that institutional inadequate coordination and disintegrated information systems can greatly add to susceptibility to fraud, and thus systemic controls play a crucial role in insurance management (Chabra, 2018). The research is however based on aggregated and publicly available data thereby making the direct identification or verification of particular fraudulent claims impossible. Moreover, the absence of time coverage equivalence between insurance and road accident data will restrict the possibilities of making

comparative analysis on a longer time. Further studies need to build on this examination by adding disaggregated, claim-level information to allow a more accurate detection of fraudulent practices and the use of more sophisticated analytical tools, including machine learning and network analysis. A further extension of the time gap between insurance and road accidents data sets would provide greater longitudinal comparisons and more conclusive inferences. Furthermore, the regional-level differences in Saudi Arabia could be investigated in the future to determine the localized risks of fraud and inefficiency in operations. Further incorporation of other data sources, including repair cost indices, vehicle characteristics, and enforcement records, would help to gain a better insight into the dynamics of claims. These extensions would aid in the creation of more specific and proactive fraud detection and prevention measures in the motor insurance sector.

## 5. CONCLUSION

The study examined the problem of insurance fraud in the Saudi Arabian motor insurance market and employed secondary quantitative data, relying on official market data. The analysis is founded on the comparisons between motor insurance claims and loss indicators reported by Saudi Central Bank and the road accident indicators reported by GASTAT, which constitute the market-level perspective of claims behavior and pressures on fraud. The results show that the volatility of motor insurance claims varies with the time despite the fact that there are durations of high growth which are not exactly in pace with the exposure in injuries or deaths on traffic. In particular, the high rates of the number of claims observed and the steady or falling rates of accident indicators also signal that claims pressure in the market is the result of other forces other than accident exposure. The characteristics of the structure that are identified include the volatility of claims, the unrelatedness with accident severity pattern and the high claim to accident ratios that are all generally associated with increased chances of fraud and claims leakages in insurance systems. These results indicate that it is essential to enhance the control of claims, enhance the combination of data among insurers and public agencies, and develop surveillance systems at the market level. Generally, the research study adds to the empirical evidence of research on insurance fraud problems in Saudi Arabia and offers a basis for future research and policy programmes to enhance the sustainability, transparency, and integrity of motor insurance.

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